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Icicles in Orange County: The Shape of Things to Come?

The Latin Drug Connection
page 12

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PERSPECTIVES

ALTHOUGH FALL HARVESTS ARE STILL UNDERWAY, analysts have already predicted larger supplies of most major crops for the coming year. The reasons: huge harvests and larger beginning stocks. Here is the latest word from USDA analysts on the outlook for major crops, exports, livestock, and farm income.

Feed grain stocks are forecast to reach 94 million tons by the season's end next fall. Huge stocks of corn will be the primary reason. The 1985/86 corn supply is projected at 9.8 billion bushels, about 1.4 billion more than in 1984/85. Farmers planted 83 million acres to corn this season, a figure economists consider relatively large in light of the 5 to 6 million acres in conservation uses and the reports of severe financial problems for farmers at planting time. Corn area harvested for grain is expected to reach nearly 75 million acres, and the harvest may approach a record of around 8.5 billion bushels. Analysts predict corn prices to average from $2.35-$2.55 a bushel for the 1985/86 season, compared with $2.65 in 1984/85. They cite the forecast record harvest, weak export demand, and rising inventories.

A larger U.S. soybean crop is also likely to mean lower prices, according to ERS analysts. Because of modest demand and substantial foreign supplies, U.S. soybean stocks are expected to rise sharply by September 1, 1986.

U.S. wheat stocks are projected to build to nearly 1.6 billion bushels by May 31, the end of the marketing year. That would break the 1982/83 record. ERS analysts say the high world wheat production expected in the year ahead points to a drop in global trade. Reduced imports by the Soviet Union (the world's largest buyer) and large world supplies will keep competition keen among exporting nations. So far, early-season exports by the United States have been very slow, signaling almost a 20% decline in shipments from the previous year.

For U.S. cotton, production is higher, but domestic use and exports have declined dramatically. With 1985 production estimated at 13.7 million bales, U.S. exports are projected to drop to 4 million bales in 1985/86 from 6.2 million bales in 1984/85. U.S. mill use is also expected to decline to 5.4 million bales, down from 5.5 million during 1984/85.

Total farm exports are expected to fall again in fiscal 1986, largely because of reduced grain and cotton exports. U.S. wheat exports, in fact, may fall to the lowest volume in 7 years. Analysts say U.S. farm product exports will bring about $32 billion for fiscal 1985 (which ended September 30), down nearly 16% from 1984's already depressed $38 billion. Projected at 129 million tons, export volume in fiscal 1985 was as much as 10% below 1984 numbers. The anticipated decline in 1986 is for the same reasons: sluggish demand, increased foreign supplies, and the ability of competitors to undercut U.S. prices.

Pressed by financial problems, U.S. cattle producers continue to reduce their herds. By July, the cattle inventory was down 4% from mid-1984 to 116 million head. Cattle producers are coping not only with larger meat supplies and low prices, but also with drought-reduced forage in some areas. Hog producers found their returns below breakeven levels for the first half of 1985. Although higher hog prices in July kept returns above the breakeven point in July, producers again posted losses in August because of lower prices.

Net farm income for 1985 is forecast at $22-$26 billion, down significantly from the $34.6 billion estimated for 1984. Both cash receipts and production expenses rose last year.

A special alert to readers: Two hot topics, farm financial conditions and farm policy considerations, are addressed in two new reports by the Economic Research Service. Single copies are available free of charge. *Financial Characteristics of U.S. Farms* (AIB-495) provides detailed measures of current financial stress among farmers. *Agricultural-Food Policy Review* (AER-530) includes "background" discussions on the U.S. competitive position in world markets, implications of emerging technologies, and the impacts of price support, acreage reduction, export, and conservation programs. For a copy of either report, write to: Hot Topics Information, Room 208, 1301 New York Avenue, Washington, D.C. 20005-4788. Ask for reports by title and number.

FARMLINE

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Practical economic intelligence from USDA's Economic Research Service

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After two "once-in-a-lifetime" freezes that cut juice yields and killed millions of trees, many Florida orange growers are wondering whether to replant. Is Florida's climate undergoing a chilling change? Economist Neil Conklin looks at production trends and meteorologist Norton Strommen examines the weather.

Developing Policies To Fit the Diversity of Rural America *by Doug Martinez* 8

The economic expansion of the last three decades has given a new look and a new diversity to rural America. These changes are examined by economist Lloyd Bender who categorizes rural counties by their economic specialty. These categories, he says, can be the focus of a new, broader rural development agenda geared to the specific needs of specific areas.

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U.S. agriculture owes a debt to many nationalities. One of those debts goes back nearly 500 years to October 12, 1492—the day Christopher Columbus landed in the New World for the Spanish empire.

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Icicles in Orange County: The Shape of Things to Come?

To replant or not to replant—that is the question facing many Florida orange growers after two consecutive "once-in-a-lifetime" freezes. The two cold snaps—in December 1983 and January 1985—cut juice yields and ruined some fruit. More important, the freezes killed millions of trees.

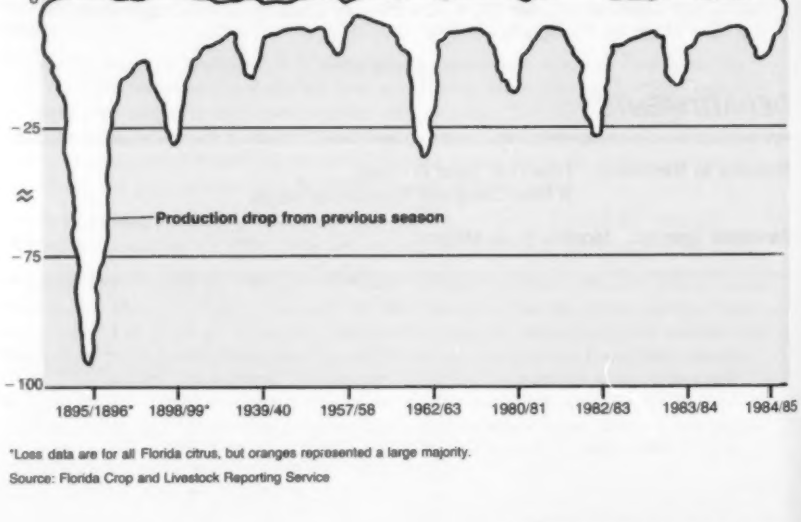
In fact, Florida has suffered four freezes in the last five seasons. USDA economist Neil Conklin of the Economic Research Service says that the freezes have caused shifts in the Florida citrus industry, especially oranges. Many orange growers (as well as lenders investing in the industry) are questioning the wisdom of replanting in some areas because they wonder if Florida's climate is undergoing a chilling change.

Severe freezes are nothing new to Florida *(see accompanying box)*. But there has been such a spate of them lately, Conklin says, that the expanding Brazilian orange industry has been able to gain a firm foothold in the lucrative U.S. orange juice market.

Brazilian juice imports were once thought of as supplements to U.S. production in freeze years. No more. "After boosting output to meet one U.S. freeze after another," Conklin says, "Brazil's industry has really taken off." Although Brazilian production per tree is no match for U.S. yields, the country now has more than twice as many orange trees as Florida—about 102 million versus 50 million.

The Brazilians are becoming permanent competitors for other reasons as well, including lower costs of production. Also, they are now shipping increasing amounts of juice concentrate directly to U.S. consum-

Freezes Have Battered Florida's Orange Industry Since the 19th Century



*Loss data are for all Florida citrus, but oranges represented a large majority.

Source: Florida Crop and Livestock Reporting Service

ing regions, although the largest amount still goes to Florida.

Thus, Florida orange growers have to contend with recent tree damage and loss, growing foreign competition, and now the emerging question: What is happening to Florida's climate?

A Freeze in Frostproof

The recent change in Florida's weather makes the names of some locales there ironic. Two counties that took deep, probably permanent tree losses in the last freeze are Orange County and Citrus County, in the north central growing region. Bob Terry, a USDA statistician in Orlando, says, "There are virtually no trees left alive in Citrus County, and north Orange County is completely gone."

A town in central Florida, in the famous orange-growing Ridge District, was confidently named Frostproof in the 19th century. In last January's freeze, the temperature in Frostproof fell to 22 degrees.

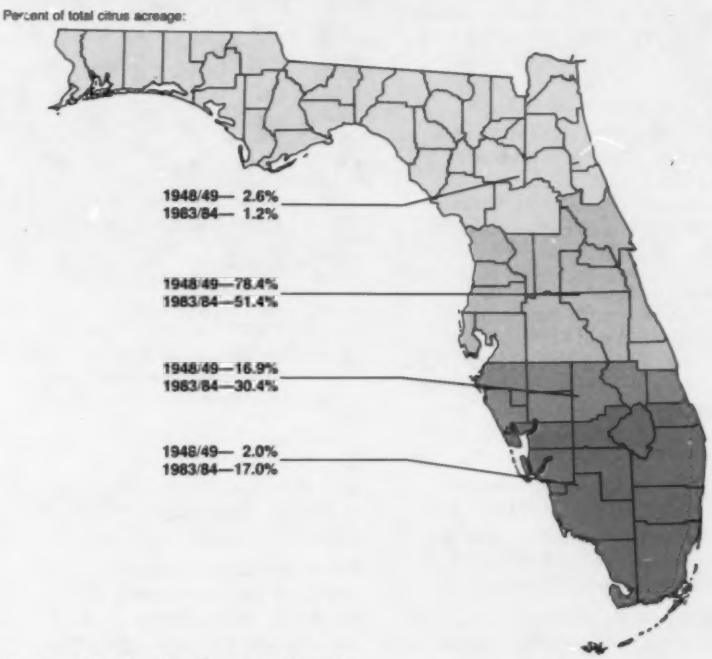
Florida's orange groves have shifted south over the years, Conklin says, mainly to escape freeze damage. Production in the mid-1940's centered in the north central area of the state. Today, about half of Florida's oranges are grown in the southern and south central areas. In some cases, growers moved onto less favorable soils to obtain more favorable temperatures, Conklin notes.

"Contrary to what many people believe, our climate is dynamic, not static," says USDA meteorologist Norton Strommen.

"Worldwide, we're going through a cooling period that began in the 1940's," says meteorologist Strommen. The cooling period was preceded by a warmer stretch that began around the turn of the century. Some analysts theorize that growers may have been lulled by a long period of atypically warm winters in the decades just before the industry underwent its greatest expansion. The expansion began around 1945 with the advent of frozen concentrated OJ—Florida's most important citrus product.

Why have we been going through a cooling trend since the 1940's? "Frankly, climatologists aren't sure," Strommen says, but there are several possible reasons: greater man-made debris, such as industrial pollution, in the atmosphere; slightly less energy coming from the sun; or greater natural atmospheric debris from dust storms, volcanos, etc.

Florida's Orange Groves Have Shifted South Over the Years



Figures may not add exactly to 100 percent due to rounding.

Given the gradual cooling, can climatologists tell Florida growers what to do about replanting? The decision is a huge one, since new trees take about 5 years to bear fruit, and 25 years to reach top bearing capacity. That is a big investment in both money and time. Alternative crops, such as watermelons, produce much lower returns, and so do most other uses, such as forestry or forage. Also, when acreage is permanently taken out of citrus production, its value plummets, making the replanting dilemma even more difficult for landowners.

Meteorologist Strommen says that, unfortunately, "we don't have a demonstrated skill in climate prediction. The best we can do now is take climatological records, look at patterns, and use that for determining probability." But he still believes that considering climate patterns is important. Strommen cites one recent weather survey, done in Illinois, which found that the best predictor of the next 5 years is the last 5 years—which surely would discourage freeze-weary Florida growers.

However, he feels that "you want to take the best and the longest record you've got to work with." Even if the record does not

(continued on page 7)

Florida's Big Chills

Although recent Florida freezes have been bitter, the state's orange growers have had hard times before. As far back as 1835, the nascent citrus industry suffered what was termed a "Great Freeze." But growers wrote it off when subsequent seasons went well, and a scientific explanation for the cold was formulated: An iceberg must have drifted by somewhere off the coast of St. Augustine.

The worst freeze of the 19th century was a one-two punch that occurred in December 1894 and February 1895. The cold killed almost every orange tree in the state and cut production an astonishing 97 percent. Groves in the area of Jacksonville were permanently abandoned, and many growers left the state for good. Others grew vegetables among their replanted trees, waiting for the groves to mature. Production did not fully recover until 1910, with orange acreage located farther south.

Probably the coldest freeze ever recorded in Florida hit in 1899—the low was 6 degrees. But, since most of the state's trees had been killed 4 years earlier, damage was less severe than it would normally have been.

In the winter of 1939-40, Florida temperatures were below normal every month, with fruit damage reaching to the southern limits of cultivation. But tree damage was not as bad as expected, because cold in the early months of the winter had made trees partially dormant.

Until the 1980's, the worst freeze of the 20th century was the one that hit in mid-December of 1962, carrying an arctic wind that stayed for 4 days. Orange production, which in the winter before had surpassed 100 million boxes for the first time, fell to 72 million boxes and then to only 55 million in 1963/64. Tree damage was extensive. One grower says his main memories of summer 1963 are "the sound of chain saws and the smell of fires" as big limbs were pruned and burned.

Florida growers will remember the 1962 freeze for another reason: It gave a boost to a new competitor—powdered, artificially flavored orange drink.

The freeze raised prices of real juice and drove away a fair-sized chunk of the market. It took almost 10 years of promotion for Florida orange juice to regain all the market it lost that season. Some industry spokesmen say that recent Brazilian inroads into the U.S. market at least have the advantage of keeping consumers in the habit of buying OJ.

The freeze at Christmas 1983 hit especially hard because it was preceded by a mild early December—setting the trees up for severe damage. Worst hurt was an 11-county area of central Florida containing 260,000 acres of groves, mostly oranges.Thirty-six percent of the live acreage was killed, and only 3 percent escaped any freeze damage. In a University of Florida survey the next summer, growers said that they would abandon citrus production on at least a fifth of the area.

Still, the '83 cold spell was only a prelude to the freeze of January 1985, which state officials have termed a "wipeout."

In midday on January 20, Tampa temperatures were balmy, in the 60's. Then a front blew through and temperatures began to plummet. By early the next morning, the mercury hung in the low 20's. Jim Noffsinger, a meteorologist with Florida's Federal-State Frost Warning Service, was "flooded with calls" as growers tried to get a fix on how long the cold would stay critical. The answer: another whole day.

It was late in the morning of the 21st before the air temperature even rose above freezing, and it didn't stay there for long. The high for the day in Tampa was 39. Another 24 hours of tree-killing cold followed. The growers, says Noffsinger, quit calling to ask how much worse things were going to get because "it was like staring at a freight train from the middle of the tracks."

When the cold spell finally ended, the icing inside the fruit turned out to be less severe than in the '83 freeze and growers were able to rush many damaged oranges to juice processing plants. But tree damage and death were unprecedented in this century, according to preliminary results from another survey of citrus growers in central Florida.

The growers report that fully half of living citrus acreage was lost. Another 36 percent of acreage was "severely damaged."

Growers were also surveyed on what they plan to do with their acreage now. They indicate that they will keep 46 percent of it in citrus production, move 14 percent into other agricultural uses, and put another 14 percent into development. Six percent of the land will simply remain idle, and the fate of the other 20 percent of it is undecided—as growers ponder the probability of still more great Florida freezes.

give fail-safe conclusions, it can help citrus growers make a more informed decision.

Some Conclusions

Some of the conclusions that climatologists have been able to reach are these:

- Variability in Florida's weather has been increasing since the mid-1970's, with temperatures reaching higher highs and lower lows. Strommen says "I don't call that a climatic change. I just call it a return to the variability we saw in earlier periods."

- Overall, the world climate fluctuated more in the distant past than it has in the last 200-300 years, according to ice core samples, river and lake sedimentation, and other evidence.

- Statistics on Florida's low temperatures vary greatly depending on the period selected. Selecting too short a period can lead to false conclusions. For example, Strommen found that if you use the winter lows between 1921 and 1950, they indicate that freezes as deep as 21.4 degrees F can be expected only once every quarter-century. But, if you use the lows that occurred between 1893 and 1985, you should expect a 21-22 degree freeze every 10 years. Tree limbs start to die when temperatures fall below about 25.

- Some scientists have theorized that the earth's atmosphere may start to warm slowly because of increasing amounts of carbon dioxide released when fossil fuels are burned. This "greenhouse effect" has not been proved. What has been proved, Strommen says, is that global averages do not necessarily hold for any one region. A region's climate may be moving in the opposite direction from global average temperatures.

Finally, besides the questions of *macro*climate—the climate of the whole earth or a large region—Strommen points out that growers should remember the importance of *micro*climate. The microclimate characterizes a small area and results from the interaction of many features, including elevation, soil type, and proximity to water.

Thus, Strommen says growers who are unsure about replanting should remember to consider these factors, too:

- Elevation may make a more northern site in Florida just as favorable as a locale farther south. Heavy, cold air falls into low spots, and so topographical features may make some interior parts of southern Florida almost as cold as the most favorable sites in the central or north central section of the state. One meteorological study showed that, within a quarter of a mile in central Florida, minimum temperatures could vary by as much as 18 degrees from the highest elevation to the lowest.

- Different soil types lose heat more or less rapidly during a freeze. Sandy soils radiate heat away quickly, while clay or loam soils retain heat longer and so protect trees better. □

[Based primarily on information provided by USDA economists Neil Conklin and Ben Huang of the National Economics Division, Economic Research Service, and meteorologist Norton Strommen of the World Agricultural Outlook Board.]

Comparing Oranges and Oranges

Both Florida and California raise oranges, but that's where the similarity ends. The oranges look different, grow on different types of trees, and go to different uses, according to economist Neil Conklin of the Economic Research Service.

Southern California's desert climate lends itself to a thick-skinned, less juicy orange. Florida growers like to say that if you ran over a California orange in the road, it wouldn't leave a wet spot. That's obviously an exaggeration, and California produces what is often considered the better "eating" orange.

Of total U.S. orange production, about 30 percent typically comes from California. Most of these oranges go to the fresh market, where they are promoted for their large size and easy peeling and sectioning. Typical California orange varieties are the navel and the Valencia.

Most Florida oranges, by contrast, are the low-glamour, high-juice workhorses of the U.S. orange industry. Of total U.S. orange output, Florida produces about 65 percent—104 million boxes in 1984/85. Over 90 percent of these, Conklin says, go into juice or other processed products. Typical varieties raised in Florida include the Hamlin and Pineapple.

Developing Policies To Fit the Diversity of Rural America

Counties that have heavy concentrations of mining industries are subject to boom-and-bust economic conditions, depending on the demand for their product. Strip mining may also threaten the rural environment.

Population growth and economic expansion have given a new look to the landscapes of rural America. That, in turn, is prompting rural researchers and policymakers to take a new look as well.

"Whether the rural development efforts of the past three decades have been successful or have spoiled the countryside is a matter of debate," says economist Lloyd Bender of USDA's Economic Research Service. "What can't be argued is the change itself. Rural development has been responsible for a changed environment."

Bender and a team of ERS analysts, including economist Bernal Green and sociologist Peggy Ross, recently examined the economic transformation of rural counties over the last several decades.

Their conclusion: Needed is a new, broader perspective on the economic issues facing rural America and the policies suited to future rural development patterns.

According to Bender, the new perspective is complicated, in part, by the increased diversity found in rural America. Change and diversity have altered and added to the range of issues and problems distinctive to different nonmetro areas.

In the past, he adds, rural problems were easier to target, and goals were, perhaps, easier to set. Researchers focused on such widespread, generalized problems as lack of adequate housing and public services, the migration out of rural areas, and the declining labor requirements of agriculture. It was logical to use the metro standard of living and other measures of metro development as goals to be achieved in rural areas as well.

Distinct But Diverse

Many of these goals have since been achieved, he says. Certainly, three major changes in rural areas have rivaled the kind of development that is considered urban.

"First, the nonmetro population growth rate of the 1970's exceeded that of metro areas, reversing a decades-long trend of net rural outmigration in many places," Bender says. "Second, the overall industrial mix of metro and nonmetro areas has become more similar because of the long-term decline in employment in agriculture and mining, and increases in manufacturing, services, and government activities in nonmetro areas. Third, the disadvantages of rural areas and the poverty in these areas were greatly reduced."

It might be tempting, Bender says, to record this progress and close the books on rural areas.

"The changes of recent decades make it appear to some observers that rural areas now share the characteristics and problems of metro areas, that there is no longer any justification for distinguishing between the two. That view is inappropriate," he says.

"Nonmetro areas are becoming more diverse as each of them continues to specialize in different activities. Add them all together, and their diversity presents an image of considerable strength. On an individual basis, however, each county cannot be looked at as a microcosm of the whole. Rural counties are usually too small to develop highly diversified economies. Instead, different types of basic economic activities tend to concentrate in separate locations."

The rural resurgence of the 1970's was driven in some areas by higher prices for their energy and mineral deposits, while other areas expanded because of employment growth in manufacturing and services, including government services. Still others grew because they were attractive as retirement or recreation destinations.

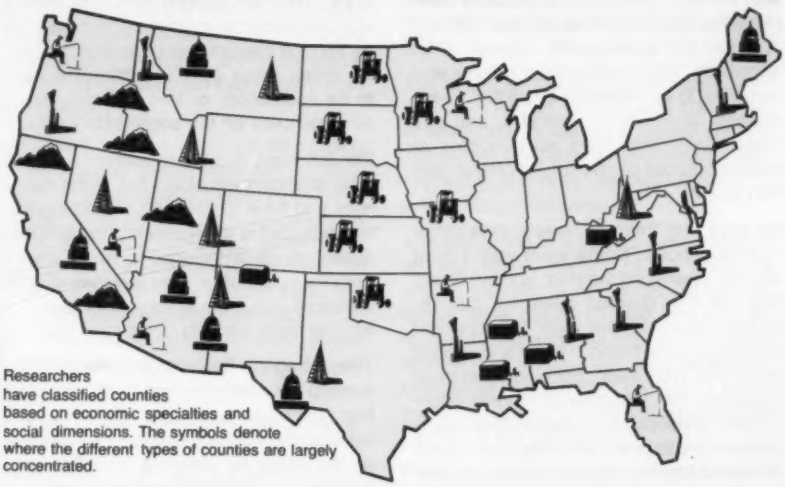
Documenting Rural Differences

Bender and his colleagues have documented the economic specialization of counties in nonmetro America, showing how the type of specialization in each county separates it from others with a different specialization. "Such descriptions," Bender explains, "mean that one group of counties will react differently to a particular policy, and that one policy is inappropriate for all counties. A mix of policy initiatives for rural development seems appropriate."

Based on their research, Bender and his colleagues have divided the 2,443 rural counties into several, sometimes overlapping categories that should be included, they say, in the policymaker's perspective. Five of the groups describe the type of regional rural economic specialization: farming, manufacturing, mining, retirement-destination, and government activities. The sixth group identifies the counties in which a large proportion of the land area is federally owned. The remaining group—persistent poverty counties—is based on social dimensions that are not necessarily related to an economic specialty, but are

Counties that are dominated by federal lands often have limited options.

The New Look to Rural Landscapes Is a Diverse One



Researchers have classified counties based on economic specialties and social dimensions. The symbols denote where the different types of counties are largely concentrated.

Farming—702 counties, concentrated largely in the Plains portion of the North Central states

Manufacturing—678 counties, concentrated in the Southeast

Mining—200 counties, concentrated in the West and Appalachia

Retirement—515 counties, concentrated in several northern Lake states as well as in the South and Southwest

Government—315 counties, scattered throughout the country, but with some concentration in the West

Federal lands—247 counties, concentrated in the West

Poverty—242 counties, concentrated in the South, especially along the Mississippi Delta and in parts of Appalachia

nevertheless of special interest to rural officials.

- Farming: "Farming continues to be the dominant economic specialty in 702 rural counties," says Bender. "They have economies based on a highly capitalized farming industry and are especially sensitive to agricultural policies, changing interest rates, and foreign trade. These counties are concentrated largely in the Plains portion of the North Central region."

- Manufacturing: "Manufacturing has become the major economic specialty in 678 nonmetro counties, concentrated most heavily in the Southeast. These counties have larger populations with more urban areas. They are subject to recessions in goods-producing industries and are especially vulnerable to foreign competition," says Bender.

- Mining: There are 200 counties primarily dependent on mining of nonrenewable natural resources. Mining counties have been subject to wide swings in demand for their products, although wage rates and average incomes have tended to remain high. These counties are concentrated in Appalachia and scattered parts of the West.

- Retirement: New retirement populations are forming in 515 nonmetro counties concentrated in the Great Lakes area and stretching into the South and Southwest. They have grown rapidly for the past two decades. Their populations tend to be located predominantly in the open country, and many of these counties are completely rural. Retirement income from outside sources fosters development of a wide range of economic activities and the employment of people of all ages.

- Government: Government plays a major role in 315 rural counties scattered throughout the United States. They have had rapid population increases, but incomes are lower than in most other county groups. Heavy dependence on federal and state government activities such as national parks, military bases, prisons, health centers, and state universities means that shifts in governmental functions and in spending priorities will affect these coun-

ties. Changes in programs to provide special assistance to areas with high concentrations of government activities will also have an impact, Bender says.

- Federal lands: Federal lands dominate in 247 nonmetro counties, mostly in the western part of the United States. Their populations have grown more rapidly than most other counties, even though population density is very low overall. Federal ownership in these areas constrains the type and level of economic development because much of the land is available for only limited private use.

- Poverty: persistent poverty continues to plague 242 nonmetro counties. These counties have ranked in the lowest fifth in income for the past three decades. They have high proportions of people with low education levels, disabled persons, and households headed by females. Minorities tend to be heavily represented in their populations.

A New Rural Policy

Key questions in rural policy are "Where do we go from here?" and "How do we get there?" Bender and his fellow researchers are not proposing a particular direction for rural policies themselves, but they do suggest that the county groupings provide some outlines and options of such a policy.

"It's fairly clear," Bender says, "that domestic and international trends will have different impacts on each group of counties. Declining exports, for example, affect farming, manufacturing, and mining counties. Some foreign goods also compete in domestic markets. And, in some manufacturing sectors, plants are moving overseas."

He points out that "if you are in such a county, it's wise to know how many of these trade effects are hitting you. Better yet, counties could design new industrial development efforts along lines that minimize adverse trade developments. Or, at the very least, they could be prepared to move in as export markets expand when the U.S. dollar begins to decline and foreign trade perks up."

Bender says "the reason for optimism on that count is that those U.S. manufacturing plants which have withstood the severe competition with foreign manufacturers are now very efficient. They're in an excellent position to capitalize on their efficiency when the time is ripe."

In contrast, retirement counties know their time is ripe right now—and for the foreseeable future as well.

"The number of retirees is growing each year and will be for several more decades, and retirement ages are also coming down," says Bender. "We aren't necessarily dealing with people who move each season and may not put down roots, the so-called 'snowbirds.' We're talking about retirees who can afford to live wherever they want. These retirees have money, spend it, and pay taxes. Some also have ready access to outside sources of investment capital, and they use it."

He adds that "retirees have a wide range of preferences. Some want year-round warmth, others cool weather, and still others like the four distinct seasons. Consequently, counties that cater to retirement lifestyles can be found in snow and sunbelt areas and in between. Such counties must recognize that the influx of retirees offers a local development potential that needs special care to make and keep their region attractive for its particular group of retirees."

Boom-and-Bust Counties

For many counties, stability is not likely to be enjoyed anytime soon. Instead, boom-and-bust conditions may prevail.

"Some groups of counties are on an economic roller coaster," cautions Bender. He cites mining, oil, and mineral producing counties as the best examples.

Some of these counties are highly vulnerable to changes in energy demand, adds ERS economist Ed Smith. Smith says that "eight of the top 15 energy producing states show at least half of their identifiable energy employment in nonmetro areas." The list is led by Texas, where one-fourth of the nearly 240,000 persons employed in energy production are in rural areas.

Bender says, however, that "some manufacturing counties may also be riding a boom-and-bust roller coaster. Local governments in these counties have to be careful not to go too far into debt in good times only to be left with a variable, stable, or, at worst, a declining tax base at some future time."

And then there are the counties that never even have occasional boom times.

"We have counties that have been left behind in the past several decades," Bender says. "Their populations tend to be heavily weighted with characteristics that hinder entry into the mainstream of economic activity. Either these peoples' difficulties have to be addressed, or they will continue to be dependent on the social safety nets."

Bender, Ross, and Green acknowledge that rural development strategies in the future may also have to deal with something that isn't reflected in their research: the kind and quality of life envisioned in any comprehensive rural policy. This includes greater concerns about the environment and preserving many aspects of the rural lifestyle.

They do agree, however, that the first step forward for rural planners is to recognize that "the unique character, strengths, and vulnerabilities of each county type can serve as the focus for devising workable rural policies. Counties with similar interests may want to form coalitions merging their resources to help solve common problems." □

[Based largely on information provided by economists Lloyd Bender and Bernal Green and sociologist Peggy Ross of the Agriculture and Rural Economics Division, Economic Research Service.]

Places in the Heart of Missouri

It can be a heartrending decision, but some farmers feel they have no other choice: They *have* to give up farming.

Why: In a word, economics.

Although there have been no long-term studies, recent research indicates that financial stress is a major reason that farmers decide to leave the land before they're ready to retire, according to rural sociologists Bill and Judy Heffernan of the University of Missouri.

Their conclusions came, in part, from a study they completed earlier this year in cooperation with USDA's Economic Research Service. The study is based on interviews with former farmers from the north central Missouri Corn Belt.

This part of Missouri was chosen mainly because of its good-quality farmland, the fact that researchers knew the area had been affected by the current agricultural crisis, and because it is more than 50 miles from a metropolitan area. (The distance limits the availability of higher paying metropolitan jobs which can often keep a farm from going under.)

The names of those who had left farming during a 5-year period from Jan. 1, 1980, to Jan. 1, 1985, were compiled by the Heffernans. In all, 41 families were contacted and 40 interviews conducted. (One family declined the interview saying that, although they'd like to help, they couldn't relive the pain and trauma of losing their farm.) All of those interviewed identified financial stress as the primary reason they stopped farming.

Although those interviewed were never asked if their farms had gone into foreclosure, Bill Heffernan says, a significant number volunteered that they had been forced to liquidate by their lenders.

A few said they got out "while we still had something left." And most of them spoke of continually losing money since 1979. It should be noted, Judy Heffernan says, "when we say financial stress, it can mean anything from bankruptcy to just admitting that it's financially unsound to continue farming." But, she adds, over half the families interviewed were not able to pay off all their debts even when their assets were liquidated. "And this can have a long-lasting impact in the community."

Lives Left Behind

During the interviews, the Heffernans were able to get a vivid picture of the lives and farming operations these former farmers and their familes had left behind. They found many similarities.

Many were fairly new to farming. About half began operations in the 1970's or 1980's. Nearly three-fifths rented all of their land when they started out, and more than half began farming with another family member, usually a parent.

Most were fairly young. "While the couples interviewed ranged in age from 22 to 64, 75 percent of the husbands were under 45 years of age, and 84 percent of the wives were younger than 45," Judy Heffernan says.

The average operation, when each farm was at its largest, consisted of 500 acres, of which 200 acres were owned and the rest rented. The farmers raised mostly grain, soybeans, and hogs, although there were a few cattle producers.

Virtually all the families were committed to farming. Ninety percent of the husbands and 38 percent of their wives grew up on farms. Nine out of 10 said they had intended to make the majority of their family income from farming. But, even when their operations were at their peaks, a third of the men worked at nonfarm jobs and so did half of the women.

Perhaps the most significant question that researchers asked was whether these families wanted to give up farming. The answer was a unanimous, "No."

Many said they would have been able to continue if interest rates had been lower. Others said higher commodity prices or more favorable government policies could have kept them going.

Eighteen percent claimed they could have continued if the Farmers Home Administration (FmHA) had reorganized their loans. And 10 percent said they would not have quit if they'd been able to find off-farm jobs to supplement their farm incomes.

Anxiety and Uncertainty

All the families acknowledged the tremendous stress they felt when they finally had to quit. Half had to immediately move from their homes. A third of those who remained on their farms planned to move or were still uncertain if they would have to move.

While most said that their families and friends offered encouragement and emotional support, two-thirds indicated that there were people with whom they tried to talk who didn't understand and were not concerned.

Only five families indicated that any organization—a church, government agency, or other group—offered or provided them with assistance. Those who did get some help mentioned attending stress seminars or counseling, or receiving personal loans, grants for their own retraining, or other financial aid.

With farming behind them, have their situations improved? Financially, the answer seems to be no, Bill Heffernan says.

When comparing their current financial circumstances to their situations in January of 1980, 63 percent of the families said things were either "worse" or "much worse now." "Although, in many cases, these families were relieved of heavy debt loads, cash flow remained a serious problem," Judy Heffernan says. "Eighteen percent of the families said that their incomes were not at all adequate for basic living needs." Only 28 percent described their finances as "better."

The families were a little more positive when asked about their satisfaction with the quality of life. Forty percent said it was better. But, according to Judy Heffernan, this feeling may be a reflection of the absence of the serious problems they'd just lived through. For many, she says, at least the anxiety and uncertainty over farming were largely over. □

Illicit Drugs: The Latin Connection

The United States is a booming market for a special category of cash crops from several Latin American and Caribbean countries—but this huge and thriving trade isn't counted in official USDA statistics.

Instead, the figures, and they are only rough estimates, come mainly from the U.S. Drug Enforcement Administration (DEA). Economist Larry Deaton of USDA's Economic Research Service recently examined these figures.

"Cocaine imports, particularly, have been phenomenal, reflecting the rapid increase in use among Americans," says Deaton. "Obviously, domestic demand also fuels imports of marijuana and heroin."

According to current DEA estimates, 22 million Americans have tried cocaine, and 4 million Americans are regular users. For marijuana, the numbers are larger but also more stable. An estimated 25 million Americans use marijuana at least once a month. Heroin use is largely limited to America's inner cities, where nearly one-half million Americans are addicted.

Sales of illegal narcotics in the United States from all sources last year were somewhere around $50-$80 billion. Most of that money probably stayed in the United States, however. Experts suggest that perhaps only $2-$4 billion went back to the exporting countries. That's because the retail, or "street" value of illicit drugs can range up to 20 or more times that of "uncut" narcotics coming into the United States.

The imports come from Thailand, Turkey, and other parts of the world, but most of the major suppliers are closer at hand. Although the Colombian connection for cocaine has been widely publicized in the press, the Western Hemisphere supply routes for illicit drugs can also be traced to Bolivia, Peru, Mexico, and the Caribbean country of Jamaica.

"For these nations, at least, the story behind the drug traffic involves sensitive issues of political sovereignty and national economies, centuries-old traditions, and competition for agricultural land and input resources," says Deaton.

Law of Supply and Demand

The most visible factor at work, certainly, is the law of supply and demand. With U.S. demand high and rising, the supply of powdery white mounds of cocaine is mounting too.

For the drug-exporting countries, such sales provide much-needed revenues. And in at least one case, the sales are critical to the country's economy. Bolivia, for example, depends on its coca leaf sales (from which cocaine is derived) as a major earner of foreign exchange. Earnings from drug exports probably exceed earnings from all other agricultural exports combined, says Deaton.

Although it may be the extreme example, Bolivia illustrates the fact that the economics of the drug trade and political realities are often closely aligned in these nations.

"To appreciate the difficulty of controlling coca leaf production in Bolivia, you have to understand that it is virtually the only bright spot in the Bolivian economy," says Deaton.

"Control is especially made difficult by the instability of the Bolivian political system and the harsh realities facing the Bolivian economy," Deaton continues. "Since independence in 1825, it has averaged more than one change of government per year. Economically, Bolivia is among the poorest and least developed nations in South America. And since 1981, a number of factors have caused the economic situation to deteriorate significantly. These include low mineral prices, worldwide recession, and several floods and droughts. Inflation was running at 1,500 percent in 1984 and is now totally out of hand."

Marijuana Is a Value-Added U.S. Import, But Most of the Value Is Added After It Comes Into the Country*

Colombian grower	$3-$8
↓	
Colombian broker	$25
↓	
Colombian exporter	$40-$80
↓	
U.S. importer	$165-$325
↓	
U.S. distributor	$265-$415
↓	
U.S. retailer	$575-$960

*All prices received are for 1 pound of marijuana. Figures are from the U.S. Drug Enforcement Administration.

Bolivian producers have protected themselves by tapping into sources of political and economic power.

And that's not all, he says. "The Bolivian treasury is practically bankrupt, and the country has a $2.5 billion external debt that stands little chance of being repaid on schedule. The government has adopted austerity measures to meet demands of the International Monetary Fund. These measures, along with a move against the coca producers in one region, prompted massive strikes, work stoppages, and large demonstrations."

Weaving Their Way to Influence

Bolivian producers have been proficient at weaving their way to political influence.

"The cocaine traffickers located in Santa Cruz, Bolivia, tend to be individuals who were successful in legitimate businesses and expanded their activities into narcotics. The net result of this is that they are largely protected by their connections to political and economic power," says Deaton.

But not all those who produce coca leaves work outside the law. In some parts of Bolivia and Peru, it is legal to produce coca leaf to provide for the legitimate uses of cocaine in medicines and flavorings. Also complicating any right-or-wrong view of the drug is its traditional use by native Indians, especially in Peru.

"Coca leaf production goes back centuries to the Incas, and Peruvians have no desire to stamp out this practice," says Deaton. "About 1.5 million Peruvians, mainly rural inhabitants of the high mountainous areas, chew the leaves every day."

The Peruvian government even has a state marketing board (ENACO) to regulate coca leaf production, under laws and decrees that stretch back into the 16th century.

"Under authority of this board, Peru legally exports coca leaves and cocaine base for medicinal and flavorings use," says Deaton. "In addition to legal uses regulated by ENACO, however, large quantities of coca production are diverted into illegal channels. They are mainly converted into coca paste or cocaine base and smuggled into Colombia for conversion into cocaine."

A Situation Beyond Control

Deaton adds that "ENACO has attempted to control production in recent years, but the situation is really beyond its control."

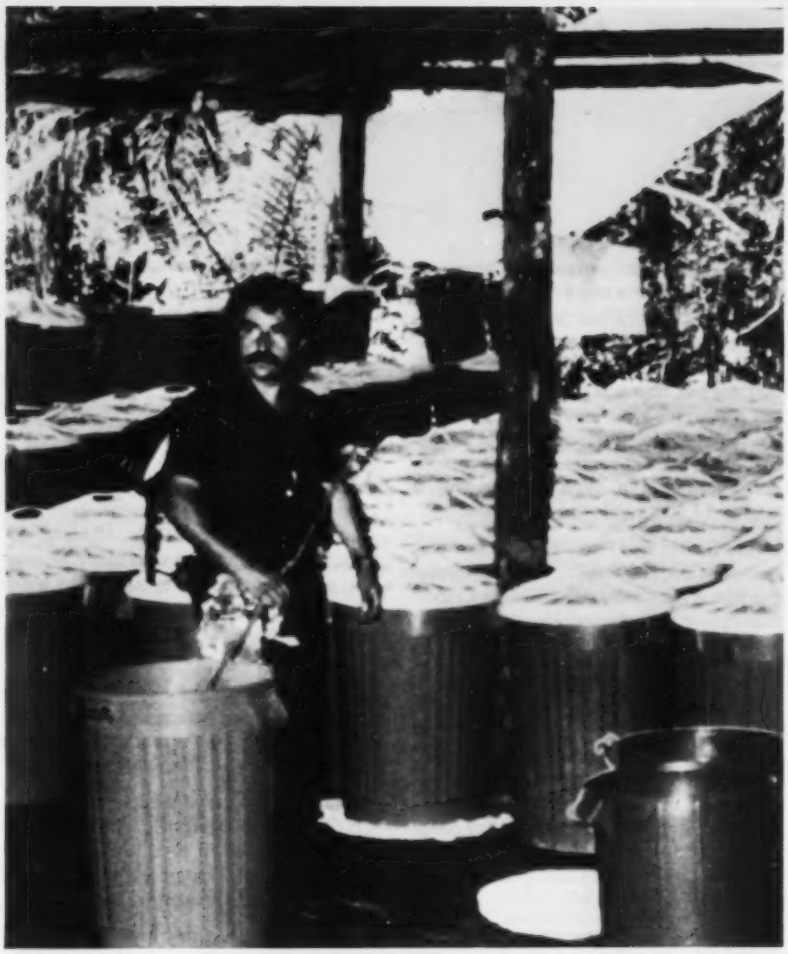
Here again, the government is stymied by powerful interests within the country.

"Politically, there is considerable resistance from certain national politicians who come from the important producing areas to do anything that will effectively curtail production."

The same situation may exist to some extent in all five countries, but Colombia and Jamaica do appear to be making significantly stronger enforcement efforts.

Colombia's developing anti-drug program was "thrust into high gear" when its Justice Minister, Rodrigo Lara Bonilla, was assassinated last year by drug traffickers, apparently because he had been outspoken in trying to prosecute several key drug dealers, says Deaton.

"Colombia has been moving vigorously against the traffickers for several years. Recently, President Belisario Betancur has succeeded in getting narcotics-related offenses tried in military courts, and this generally should result in stricter sentences," he says. "Another important move has been the extradition of known traffickers to the United States to stand trial for violations of U.S. narcotics laws."



A government agent inspects barrels of cocaine seized at a processing camp in the Colombian jungle. *Photo courtesy of the U.S. Drug Enforcement Administration.*

He notes that since mid-1984 Colombian officials have been spraying marijuana fields with aerial herbicides, destroying up to one-third of the country's total production.

Control efforts also may partly reflect what Deaton says is a growing awareness of cocaine's harmful effects within the country itself.

"Colombian society has changed greatly in recent years in that drug abuse in that country has reached epidemic proportions among urban teenagers and young adults," he says. "To put it bluntly, Colombia now has its own problems with cocaine abuse, and this seems to have had a major effect in mobilizing the opinions of both the general public and of policymakers in attempting to deal with the cocaine problem."

Colombia Vital to Control Efforts

Such a change is welcomed by U.S. officials, because American efforts to reduce illicit drug flows hinge a good deal upon Colombia.

"Colombia continues to hold the dubious distinction of being the source of more than 75 percent of the cocaine and about 42 percent of the marijuana consumed in the United States," says Deaton. Colombia's market share of the U.S. marijuana market, however, is down sharply from a high of 79 percent in 1981.

In the past, he says, Colombia has served principally as a processing center for cocaine trafficking, refining the coca paste and the cocaine base produced in Peru and Bolivia. But coca leaf production has become entrenched in Colombia's Eastern Plains region.

(continued on next page)

"While plants can be harvested after only about 6 months, it takes several years to fully establish coca leaf production, so the efforts of the Colombian growers and traffickers in boosting domestic coca production are just about to come onstream in a big way in the next year or two," Deaton says. "Estimates for 1985 are that 15,000 to 17,000 hectares are under production, and that this area could yield an annual total of 14,000 metric tons."

Unlike Bolivia and Peru, all coca leaf production is illegal in Colombia. But enforcing this ban is extremely difficult in the Colombian terrain of high mountains and almost impenetrable jungles.

"The actions already taken by the Colombian government are likely to have negative economic effects. Even though the flow of funds to Colombia from narcotics exported to the United States has probably been exaggerated, the current crackdown may be causing a movement of drug money out of Colombia to other countries where there is less chance of confiscation by authorities," says Deaton.

In terms of value, however, Mexico remains the Western Hemisphere's largest supplier of marijuana and heroin. Moreover, Mexico is a major trade route for narcotics coming into the United States from other countries.

In terms of value, Mexico is the Western Hemisphere's largest supplier of marijuana and heroin.

"Mexico is the only Western Hemisphere country that supplies the U.S. market with significant quantities of heroin," says Deaton. "Since the mid-1970's, Mexican authorities have moved vigorously against opium poppy producers, cutting the Mexican share of the U.S. heroin market from almost 90 percent in 1977 to approximately 32 percent at the present time."

Mexico, though, produces only 2 percent of the total world opium harvest. "Even if Mexico totally halted its production, another source country could simply supply more."

Deaton also says that Mexico was the main source of marijuana consumed in the United States during the mid-1970's, but that an intensive eradication program substantially reduced Mexican exports.

"It was during this time that Colombian production and exports soared to meet the U.S. demand," Deaton says. "Recently Mexican production and exports have been increasing. This doesn't mean that Mexico isn't trying to control the drug problem. Mexican efforts remain very strong in this area, with the result that more than 300 policemen have been killed in battles with growers and traffickers."

Fighting the Economic Incentive

What makes any enforcement effort more difficult, however, is the economic incentive to grow the crops somewhere else should a particular field be destroyed. Coca leaf producers, marijuana planters, and growers of opium poppies (which are processed into heroin) compete successfully with their fellow farmers in these five countries for agricultural land, labor, and other farm inputs.

Deaton says there is now enough evidence to confirm that the production of cocaine, heroin, and marijuana in the Western Hemisphere (for export principally to the United States and Western Europe) is displacing the production of some basic foodstuffs grown for domestic consumption.

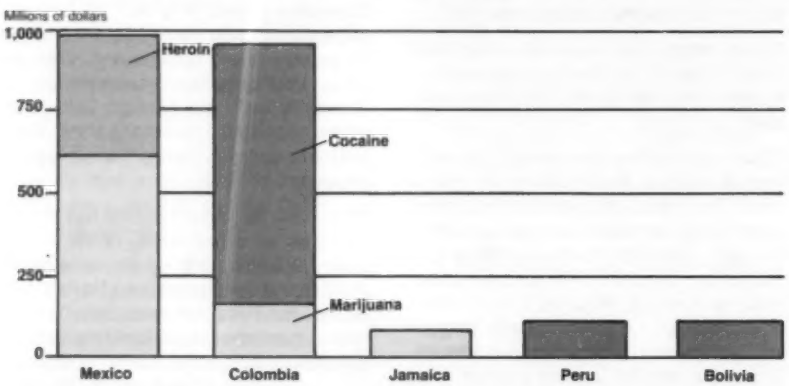
That's not bad for everyone, Deaton says. "Farm laborers who work in marijuana or coca fields receive considerably higher wages than those who work in strictly legal rural or in unskilled urban jobs." But their gain is more than offset by the apparent loss to many more people of food crops that would otherwise be grown.

Bolivia and Peru, especially, can ill afford the loss of any food production. Both nations perennially suffer food "deficits," where they're unable to produce or purchase enough food to provide an adequate diet for their people.

That suggests the urgency of the problem as much as the specter of drug addiction here, Deaton says. When farmers plant coca leaves instead of corn, the victims are not only the drug users but also hungry children in the highlands of Bolivia and elsewhere. □

[Based largely on information provided by economist Larry Deaton of the International Economics Division, Economic Research Service.]

In the Western Hemisphere, Mexico Is the Largest Supplier of Marijuana and Heroin to the United States, But Colombia Is the Capital of Cocaine



Landmarks in Land Use

Imagine a nonstop aerial tour of the United States that gave you a treetop-level view of 1,000 new acres every minute of every day—60,000 acres an hour. If you went without sleep and never took your eyes off the ground, it would still take more than 4 years to see all of the nation's land.

You would spend a total of 312 days inspecting America's cropland, 414 days soaring over pasture and rangeland, and 455 days admiring the majesty of 655 million acres of forest land. The remaining 378 days would be spent over cities and towns, parks, highways, deserts, swamps, and Alaskan tundra.

Geographer Thomas Frey (recently retired) and agricultural economist Roger Hexem, both of the Economic Research Service, offer a more useful—if less spectacular—view. Their new report classifies the major uses of U.S. land, based on recently available 1982 data.

The United States has a land area of nearly 2.3 billion acres. More than half the land is used for agricultural purposes.

About 21 percent of U.S. acreage is classified as cropland. Slightly more than 80 percent of this land was actually used for crops in 1982. Another 26 percent of U.S. land area is permanent grassland and other nonforested pasture and range. Most of this land is used to graze livestock. Nearly one-third of America's land is forested.

Who holds title to all this land? The federal government owns 730 million acres. That's nearly one-third of the nation's land area, but 45 percent of the federally owned land is located in just one state—Alaska. Another 9 percent of the land belongs to state and local governments (155 million acres) and American Indian reservations (51 million acres). The largest share, 1.3 billion acres or 59 percent of U.S. land, is privately owned.

Major Uses of Land in the United States: 1982 *by Thomas Frey and Roger Hexem. (Published June 1985; 29 pages of text and data tables, including data for states; GPO Stock No. 001-019-00398-7; $1.25.)*

Modeling Agriculture

USDA's Economic Research Service has developed a new quarterly forecasting model to churn out data on the short-term outlook for agriculture. It is designed to improve the efficiency and consistency of ERS's program of analyzing the situation and outlook for individual commodities and for the agricultural sector as a whole.

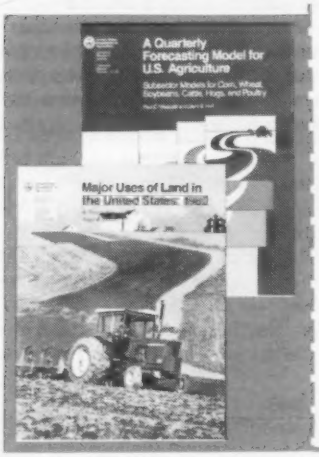
According to economists Paul Westcott and David Hull, the model will supplement other tools now used by analysts in forecasting supply, demand, and prices for major commodities. The model covers corn, wheat, soybeans, cattle, hogs, and poultry, and will later be expanded to include additional commodities.

Among its benefits: it will help link events in these individual commodity subsectors—and in the U.S. economy at large—into an overall picture for agriculture. The quarterly model can also be called upon to simulate the impact of policy changes or unanticipated developments affecting agriculture. It has been computerized for a rapid turnaround capability.

Essentially, say the authors, this model is a short-run forecasting tool intended to strengthen outlook analysis that looks three to six quarters into the future. It will help ensure that forecasts for different commodities are consistent with each other, and it will help forecasters respond quickly when policymakers want to know how their decisions, or the decisions of others, might affect agriculture.

This technical bulletin reviews the ERS situation and outlook program and indicates how the quarterly forecasting model fits into this program. It goes on to discuss the model structure for each commodity and then presents the equations for each crop and livestock subsector.

A Quarterly Forecasting Model for U.S. Agriculture *by Paul Westcott and David Hull. (Published May 1985; 47 pages of text and model equations; GPO Stock No. 001-019-00390-1; $2.00.)*



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Marketing Maple

Pancakes without pure maple syrup? Not an appealing thought for discerning consumers, but a possibility sometime late next winter, according to USDA economist Fred Gray of the Economic Research Service.

This year's harvest was smaller than expected, Gray explains, while carryover stocks from last season have already been exhausted. And, Gray says, the demand for maple syrup, maple sugar, and other maple products is definitely on the way up.

This is sweet news for producers, Gray says, because for years maple syrup and maple sugar were threatened with obscurity by the other sweeteners—cane and beet sugar, corn syrup, and, most recently, the artificial variety. The small market that remained was dominated by imports from Canada.

But the market may be changing. People are ready to take a fresh look at homegrown sweeteners, according to agricultural marketing representative Everett Willard of the Vermont Department of Agriculture. He cites today's emphasis on fitness, nutrition, and natural foods as one reason. "Maple is a purely organic sugar," he says, indicating that it has had a good reception in the health food area.

And, Willard says, U.S. maple products have also benefited from the "buy American" attitude of the last few years. But taste, he concedes, probably tops the list of reasons why maple products have gained so much recent popularity. More Americans are willing to pay the price for the extra richness and flavor of maple syrup and other products sweetened with maple.

"Maple is unique. People like the taste. But outside the Northeast, many people aren't even familiar with real maple syrup. Most supermarket brands of pancake syrup have only 2 percent maple. The rest is cane or corn syrup," he says. "Now, sales of maple syrup and maple sugar are way up, and we're seeing all sorts of manufactured products that were not available just 5 years ago."

Among the "new" maple products: yogurts, popcorn, candy, and cakes.

Advertising Pays

All this popularity is mostly the result of some major maple promotion, Willard says, referring to a wide variety of activities by producer and industry groups, usually in cooperation with state governments.

Vermont's Maple Promotion Board, for example, has teamed up with the state department of agriculture to promote syrup and sugar to export markets. They've also developed advertising programs intended to enhance the solid American "Vermont image" of maple syrup produced in their state.

In New York, maple syrup associations and the state provided funds for an advertising campaign of ads, brochures, and special "New York" packaging for their product.

Whether it's promotion, patriotism, or just plain taste that's increased the demand, expanding markets are changing the industry.

The first thing to go were surpluses. It wasn't unusual to see surplus maple syrup carried into the next season even 3 years ago, says economist Gray. "Not anymore. There are no surpluses this season, and many producers believe there will be a shortage."

Analysts have not paid a lot of attention to the tiny commodity since it accounts for less than one-tenth of 1 percent of sweetener consumption. "However," Gray says, "the increased demand is currently stirring up some interest."

"There's a lot that's new in maple sugaring these days," Willard adds, explaining that anyone who produces maple syrup has traditionally been called a sugar maker. What's not new in maple sugaring are the basic ingredients for a successful operation: the proper climate and a large enough sugar bush (the correct term for a good number of maple trees). For this combination, you've got to go north.

Where Maple Syrup Reigns

Canada and the northern United States produce virtually all the world's maple syrup, turning out about 3 million gallons in the average year.

In the United States, Vermont and New York are clearly the leaders, producing more than two-thirds of the nation's maple syrup. Some syrup is produced in every New England state, according to Willard, and also in Pennsylvania, Michigan, Minnesota, Wisconsin, Ohio, and a few other states.

Currently, however, USDA's Crop Reporting Board collects production figures only for the Northeast, including New York and all of New England except Connecticut and Rhode Island, where the industry is considered minor.

According to Paula Bailey, a statistician with the New York Crop Reporting Service, the 1985 season shaped up like this: Vermont's maple syrup tally was 525,000 gallons, down from 530,000 last year. Farmers in New York produced 315,000 gallons, down from last year's 332,000 gallons.

Total Northeast production added up to 966,000 gallons, about a 5-percent drop from 1984's 1 million gallons. Unseasonably warm weather in early spring was the chief problem for producers this year, Willard says. The decline in production would have been considerably steeper, except that

Vermont and New York Lead U.S. Maple Syrup Production

	1979	1980	1981	1982	1983	1984	1985
	in thousands of gallons (000)						
Vermont	465	315	545	500	495	530	525
New York	315	243	331	320	235	332	315
New Hampshire	76	55	104	86	84	102	92
Massachusetts	30	18	40	30	20	26	24
Maine	9	5	12	10	8	10	10
Total	895	635	1,032	946	842	1,000	966

Data compiled by the New York Crop Reporting Service.

the number of taps and producers had substantially increased over last year. "And we expect this trend to continue," he says.

Why? Sugaring is becoming more profitable, and technology is making production considerably easier.

High-Tech Sugar Making

In late February, when the nights are below freezing and the days warm enough to get the sap flowing, the season begins. It can last until mid-April, Willard says. The sap can run for as long as 6 weeks or as little as 2, and it is not predictable. The weather has to be just right.

In the traditional tapping method, farmers drilled into the tree, inserted a spigot, and hung a bucket to collect the sap. During a good run, buckets might have to be emptied every day. Multiply that times, say, 1,000 trees, and you've got a huge labor requirement.

The buckets still look traditional and quaint, Willard says, but they are gradually disappearing. In their place are networks of plastic spigots and pipes that look something like huge intravenous tubes winding around the forest. Farmers tap the trees, attaching a spigot and plastic pipe. The sap then flows through the pipes to centrally located holding tanks. Some producers use vacuum pumps to speed the process up.

"You are no longer tied to your trees," Willard says. "Producers can do other chores or even work off the farm. People who had even a few other obligations just couldn't get involved in sugaring in the old days. Now they can."

Do farmers who've used the old method find the new technique easier? "Absolutely," claims Mary McCuaig who, with her husband and parents, runs Top Acres Farm, a maple sugar and dairy operation in Woodstock, Vt. "We've gradually gone with the tubing. Last year we were down to 200 or 300 buckets. This year, we used only five out of 2,000 taps," McCuaig says. "It saves tremendously in labor costs."

Other producers agree.

Russell Davenport of Shelburne Falls, Mass., is a dairy farmer who also produces maple syrup. He tapped 5,000 trees this year and used plastic tubing for three-fourths of them. Davenport says that the tubing method really can't be beat, especially for trees that are a fair distance from your operation.

"Some producers even leave the tubing in the forest year-round," Davenport says. "They clean it up, get it out of the way of wild animals, and it's there, ready for the next season's tap."

The bigger the operation, Willard points out, the more likely the use of plastic tubing. One of the largest producers in Vermont, David Marvin, who owns Butternut Mt. Farm in Johnson, used plastic tubing on every one of the 17,000 trees he tapped this year.

But tubing is not the only technology that's made maple sugaring a bit easier for Marvin, Davenport, and McCuaig. All three also use a high-tech process called reverse osmosis that significantly speeds up the operation of turning sap into syrup.

From Sap to Syrup

The basic process of making syrup from sap hasn't changed in centuries. The sap (which is mostly water and only about 2 to 3 percent maple sugar) is boiled, usually in an apparatus called an evaporator. The unwanted water evaporates, leaving the sweet maple syrup. About 40 gallons of sap are required to make just 1 gallon of syrup.

The reverse osmosis technology is used to filter up to 80 percent of the water out of the sap before it's boiled. Then, only about 10 gallons of filtered sap are required to make 1 gallon of syrup. The process cuts boiling time by as much as 75 percent. "The technique saves an awful lot in labor and fuel costs," McCuaig says. "We bought the equipment last year for $12,000 and saved about $2,000 in fuel costs this season alone. The equipment definitely pays for itself. I can't imagine sugaring without it."

Marvin, who was one of the first producers to install reverse osmosis equipment, has used the process for 6 years. He says his fuel costs are down by 75 percent.

Davenport, who has used the process for four seasons, also reports reduced fuel costs, but adds that the savings in time is another significant benefit to him. "With filtered sap, I can make 15 gallons of syrup an hour, rather than 3 or 4, and I'm usually finished in a regular day. Now, I don't have to stay up all night with the evaporator during a good sap run."

Marketing the maple syrup, according to Marvin, is another aspect of the business in which the producer can have a considerable amount of control. Many producers sell some portion of their syrup directly to consumers from their farms, at retail outlets, or at roadside stands, he says, and many have also turned to mail order.

McCuaig says that maple sugaring now brings in about a third of the income at her family's farm. In addition to the 2,000 trees they tap themselves, the family buys sap from 6,000 taps made by other farmers. Then, they process and package all of it into maple syrup. Sales are about evenly divided between wholesale and retail, according to McCuaig. "We have wholesale contracts with seven stores," she says, "and we retail syrup from our own shop in Woodstock, as well as directly from the farm and by mail order." □

[Based primarily on information provided by economist Fred Gray of the National Economics Division, Economic Research Service; agricultural marketing specialist Everett Willard of the Vermont Department of Agriculture; and others.]

Agriculture's Spanish Legacy

American agriculture owes a debt to many nationalities who have helped shape one of the most productive farming systems in the world. One of those debts goes back nearly 500 years to October 12, 1492—the day Christopher Columbus is said to have landed in the Bahamas, opening the New World for the Spanish empire.

Today, the Spanish legacy to U.S. agriculture is reflected in southwestern ranching practices and the first cultivation of many fruits and vegetables. Early Spanish settlers, for example, carried the seeds and bulbs that produced the first oranges and onions in the Americas.

Certainly, recognition of the Hispanic role in American agriculture's beginnings is nothing new. Writing more than 50 years ago in the pages of *Agricultural History* magazine, historian Arthur P. Whitaker noted:

"From the very first, the Spaniards began to transplant their culture, including of course its basic element, agriculture, to America. Along with soldier, priest, gold-miner, and war-horse, the ships that sailed from Seville" to the New World "bore the beasts of burden, the wheat, the sugarcane, the millwrights, and the farm laborers of Old Spain to establish Spanish agriculture."

As early as his second voyage in 1493, Columbus—an Italian sailing under auspices of the Spanish Crown—introduced yearling calves, goats, sheep, pigs, hens, and seeds of oranges, limes, melons, and many vegetables into the New World.

In 1532, the Spanish Crown ordered that every ship sailing to the New World carry seeds, plants, and domesticated animals. By this time, too, the Spanish began using the branding iron to mark livestock in colonial America, a practice that has continued to modern times.

Home on the Range

Ranching, in fact, was one of the few enterprises that could survive in the so-called Spanish borderlands—now our American Southwest. Many Spaniards, accustomed to the dry plains and the semi-arid grasslands of Castile in their native Spain, understood the resource limitations of much of their New World.

Hispanic cowboys—called vaqueros—drove Longhorn cattle into the Southwest to begin a thriving livestock industry.

Thus, they could adapt more readily to the climate and land forms that they found. Specifically, land suitable for irrigation and farming was divided into small units, while dry land and pasture was allotted in larger portions through land grants issued first by the Spanish Crown and later by the Mexican government.

Hispanic cowboys called *vaqueros* drove the Longhorn cattle into Texas and other parts of the Southwest to begin a thriving livestock industry. Hispanic ranchers, moreover, were able to develop equipment and techniques for working cattle, as well as legal codes, and livestock regulations.

In northern Mexico and parts of what is now New Mexico and California, large blocks of land were often controlled by a single family. Known as *haciendas*, these landholdings were huge estates (often more than 300,000 acres in size) that were generally self-sufficient economic units. They included fields, flocks and herds, wooded areas, flour mills, forges and workshops, as well as a church and chaplain. Each estate had hundreds of inhabitants, with villages for the Indians and workers and the *casa de hacienda* occupied by the *patron* (landowner) and his family.

Haciendas were not the only ranching communities, though. More common in Florida, Texas, and Arizona were smaller individual holdings, where ranchers generally relied on the use of communal pastures and unrestricted grazing rights.

Although the land-grant system was dismantled with the end of Mexican rule in the Southwest, the Hispanic cowboys survived, using and passing on their skills as herders and horsemen.

Part of the Lexicon

Along with their contributions to ranching practices and traditions, the vaqueros have given us a lexicon that evokes the sights and sounds of the Old West, from roundup to *rodeo*.

The sure toss of *la reata*, a braided rope that became known as a lariat, was critical, of course, to roping and tying cattle and other livestock in order to brand and herd them into a *corral*. Used as a *lazo* (lasso), this rope was first fashioned into a noose and attached to the end of a short lance or stick, a technique similar to the one used on the Russian steppes. Soon, however, the lance was discarded and the noose tied in the end of a long rope.

The haciendas and Spanish missions were also the first to develop large farming operations in the Southwest. Along with Old World crops such as oranges and onions from the coast of Spain, Hispanics cultivated New World crops like corn and beans, developed by the Indians of North and South America before the Spanish arrived.

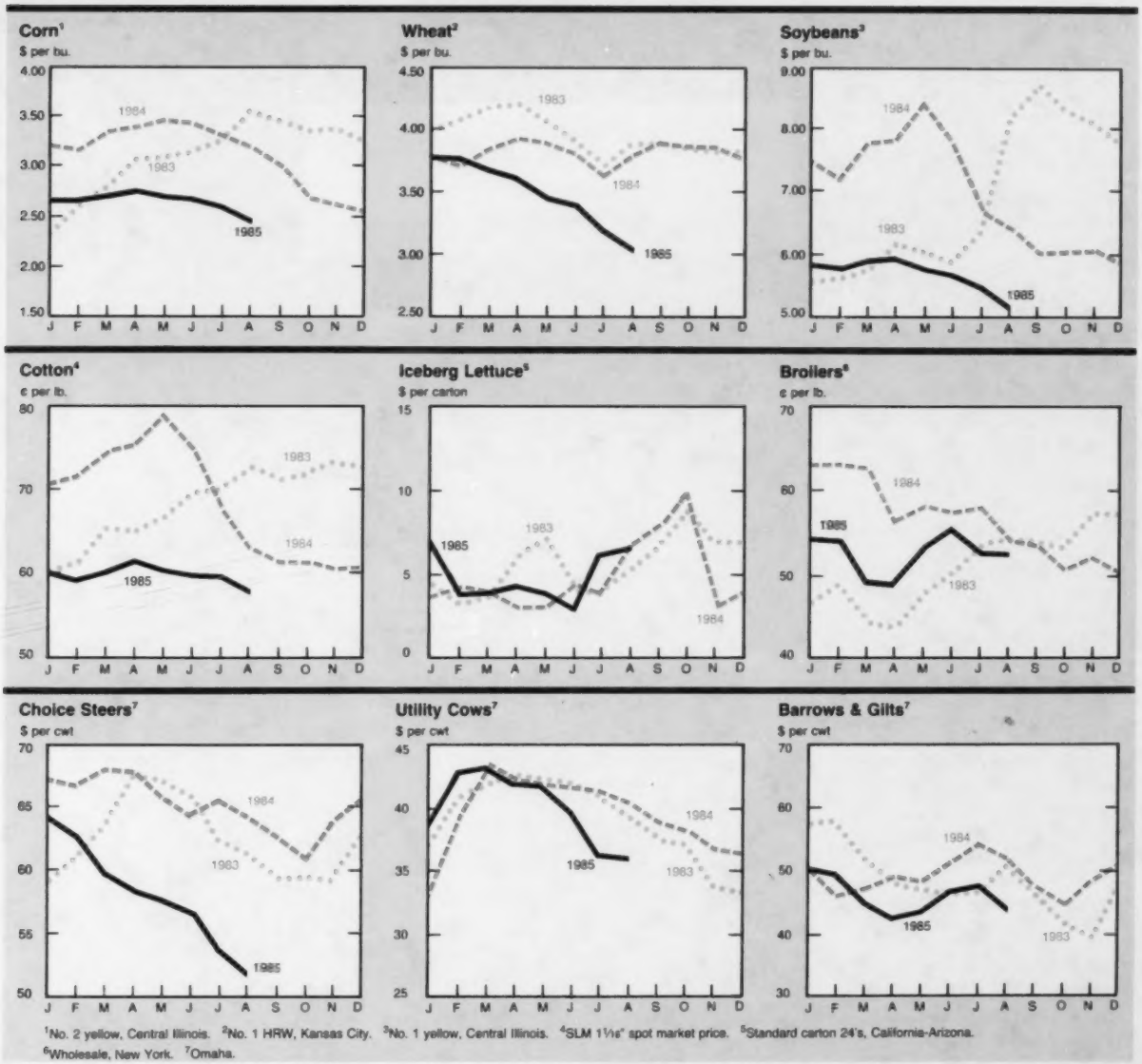
The Spanish missions, particularly, functioned as early forerunners to the agricultural experiment stations that are common today. The mission *padres*, whose ranks included the famous Father Junipero Serra, took a special interest in working with the native Indians to develop irrigation, tillage, and harvest methods suited to the American landscape.

Of course, the Indians also taught the Spanish a thing or two. When the Spanish arrived, they noticed the Indians of the Americas drinking a strong, bitter aromatic beverage made from cacao beans. The Indians also used the beans as a substitute for money in many areas of Mexico. Cacao beans were sent to Spain but remained a curiousity until it was discovered that the taste of the chocolate beverage could be improved by adding sugar, vanilla, and cinnamon. □

[Based largely on information provided by historian Wayne Rasmussen of the Agriculture and Rural Economics Division, Economic Research Service, and Phil Villa-Lobos, Hispanic Information Officer of the U.S. Department of Agriculture.]

Monthly Price Monitor

USDA's August index of farm prices declined 3.2% from July, but was down 15% from a year earlier. Corn prices dropped to the lowest levels since January 1983; soybeans, the lowest since October 1982; and wheat, the lowest since January 1978. Average prices for lettuce were in the $6 range in July and August, up sharply from $2.82 per carton during the peak of the season in June. The reasons: seasonally tighter supplies and extreme heat in prime growing areas. Among meat animals, choice steers dropped to $51.72 per cwt. Utility cow prices slipped to $36 per cwt, and barrows and gilts dropped to $43.89.



[1]No. 2 yellow, Central Illinois. [2]No. 1 HRW, Kansas City. [3]No. 1 yellow, Central Illinois. [4]SLM 1⅛" spot market price. [5]Standard carton 24's, California-Arizona. [6]Wholesale, New York. [7]Omaha.

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